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AUTHOR Moffitt, Karen
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ABSTRACT

As more children are now able to live with cancer and prepare for the future, care of the child with cancer should be directed at producing a child who is mentally healthy and who can function at an age-appropriate level in society. This presentation, given at the "Growth toward Independence" Conference in February 1987, notes the emotional, behavioral, and learning problems associated with cancer and its treatment. Four case studies are presented of children, aged 6-10, diagnosed as having various forms of cancer. Each case study assesses the child's psychological/educational, medical, speech/language, social, and psychiatric status and provides educational, psychiatric, and medical recommendations. (JDD)

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LEARNING DISABILITIES IN CHILDREN WITH MALIGNANCIES

by

Karen Moffitt, Ph.D.

Modern medical advances and quality medical care now make it possible for children to live with cancer and to prepare for their future. Accordingly, the home, the hospital, and the school must work as a team in the total care of the child. Each has a unique contribution to make in order to maximize the child's potential to continue normal growth and development as he goes through the treatment process. Any weak link can jeopardize the efforts of the other members.

About 6,000 youngsters are newly diagnosed with cancer in the United States annually. This is an incidence of 1 in every 600 children. The most common childhood cancers are leukemia, tumors of the central nervous system, including brain tumors, tumors of the lymph tissues (such as Hodgkin's Disease and non-Hodgkin's lymphoma), neuroblastoma (a malignancy of the sympathetic nervous system), Wilm's Tumor (kidney), Rhabdomyosarcoma (muscle), and osteogenic sarcoma (bone). The chances of long-term survival with these cancers depend on each child and the speediness of diagnosis; but in general, the rates range from about 85% survival for Acute Lymphocytic Leukemia, Hodgkin's Disease and Wilm's Tumor to 60% for bone cancer and 20% for brain tumors. More males get cancer than females; more white children than black; and youngsters with certain chromosomal disorders-like mongolism or dwarfism-have an increased chance of getting cancer.

Research has cited several general learning problems associated with cancer and its treatment, primarily cranial radiation (Eiser, 1978; Elliott, 1977; Pavlovsky, 1983; Meadows and Evans, 1976; Robinson, et al, 1984). A study by Meadows (1984) showed that 11 of 18, or 63% of the children with cancer demonstrated a decrement of 10 or more points in their Full Scale IQ scores between the initial test following remission and the tests administered at least three years later. The children who showed the greatest decline were between 2 and 5 years of diagnosis. Several areas of neuropsychological functioning were especially noted to be affected by the treatment. These include general memory, visual-motor integration, psychomotor problem-solving, memory for auditory sequencing, abstract reasoning ability, attention problems, and specific math and reading disabilities. In the case of brain tumors, such effects can be severe (Banford, 1976; Morris, 1977).

Children, even very young ones, are astute and know when they are having difficulties learning. Unfortunately, the adults in the child's environment may attribute the learning difficulty to the child's emotional response to his illness. Depressed and disheartened by the illness, some parents and teachers do not recognize the children's potential and have low expectations of their

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ability to achieve. Children sense this lack of faith in their future and respond to these messages with feelings of helplessness, discouragement, and sometimes rage.

Behavior problems arise in most chronically ill children. Parents are naturally sorry for the sick child and hate to deny him or her anything. Children soon learn to take advantage of this. A survey of parents found that two thirds of the respondents thought they had discipline problems (Lawrence, 1978). Teachers have found that, when compared with their healthy peers, cancer children are more prone to: be underactive, lack energy, not initiate activities, not try new things, be more self conscious, be easily embarrassed, and express emotions less frequently.

Several case studies are presented below.

Richele

Richele, a 9 year, 11 month old girl,was diagnosed with ALL 5 years ago (at the age of 4) and received intrathecal Methotrexate plus cranial radiation during her treatment.

Impressions

Psychological/Educational: Her general intellectual abilities are estimated to be in the Average range (104), with optimal verbal/comprehension abilities in the High Average to Superior range (113). Her Performance IQ was only 93. While her academic achievement is generally within normal limits, her scores in both arithmetic and reading comprehension are below the level expected on the basis of her estimated intellectual potential. Her reading comprehension is particularly low in relation to her optimal verbal-comprehension abilities. Richele's mild weakness in reading comprehension can not be explained by difficulties in the basic cognitive processes subserving reading recognition or linguistic processing abilities. Further assessment of basic cognitive abilities did suggest mild processing deficit in visual perception and visual-motor integration. This is seen primarily in the processing of more abstract visual information, and not in the processing of socially meaningful stimuli. This subtle visual-perceptual difficulty seems to affect her problem solving in tasks requiring higher order visual analysis and synthesis. Ratings by both parent and teacher indicate that Richele's attention span is generally short, and that she has difficulty working independently. Richele is also described as being a very anxious child, and this may be contributing to her reduced abilities for attention and concentration.

Medical: Physical and neurologic examination are within normal limits with the exception of possible mild hyperreflexivity on the left. Given

the fact that the remainder of the neurologic examination is normal, this is probably a nonsignificant finding. Furthermore, the neurologic examination does not indicate evidence of neurologic maturational delays typically seen in children with learning disabilities. The learning problems that exist do not appear to be on a maturational basis and further the likelihood that they are subtle side effects due to her cancer chemotherapy.

Speech and Language: Richele's speech and language abilities are above and/or at her expected age level. No speech and language intervention is necessary at this time.

Psychiatric: Richele is coping relatively well with the traumas of illness and family turmoil. There are signs of insecurity as indicated by Richele's nightmares and fears. There are positive prognostic features of interest in more social activities and improvement in school, as well as a nice ability to relate to others. Richele does not have clinical evidence of depression or psychosis.

Recommendations

Educational:

1. Richele's mother has been tutoring her and the results are evident in her work being as successful as it is. However, the only thing more difficult than being a parent, is trying to be both a parent and a teacher.

2. An SLD resource room is recommended.

3. Richele must be taught the actual strategies of reading comprehension. This can be achieved through teaching her the steps in learning outlining.

4. Because Richele's verbal comprehension is much higher than her reading comprehension, as a compensatory measure, talking books should be used. She should also read her lessons in science and social studies into a tape recorder and then play it back to further her comprehension.

Psychiatric:

1. Parental therapy is recommended to help provide a more secure and consistent home life including work on behaviors of parents to each other and Richele, as well as disciplinary techniques.

2. Group social events such as Girl Scouts should be encouraged.

Medical: No further medical/therapeutic intervention is recommended.

Eric

Eric is a 6 year old kindergartner. He was diagnosed at age 2 with retinoblastoma and received intrathecal Methotrexate and radiation. He had since suffered from seizures.

Impressions

Psychological: Eric exhibits a relative strength in verbal learning and memory. In contrast, significant developmental delays are evident in his visuoperceptual and visuospatial abilities. Visual motor integration, while impaired relative to his age group, shows a significant improvement since his last evaluation. Eric is delayed in academic achievement, as he is unable to identify letters, write hes name, or count consistently past the number three. Adaptive functioning is also delayed in communication and daily living skills. His motor skill functioning deficit is consistent with problems Eric exhibits in visuospatial/visuoperceptual abilities. Eric shows a strength in socialization.

Medical: On neurological examination, Eric demonstrates consistent signs of neurodevelopmental delay without any evidence of hard neurologic disease. Eric also demonstrates significant attentional deficits, impulsivity, and distractibility

Speech and Language: Eric's verbal abilities appear to be a relative strength for him. Although his language is immature, it is at least commensurate with his cognitive abilities.

Psychiatric: Eric appears to have sustained central nervous system damage as a result of his chemotherapy and radiation therapy. Current areas of concern are his hyperactivity and inattention, his perceptual difficulties, and his memory problems.

Social: This family has been through a lot of stressful experiences with Eric, but appear to be coping quite well. Family relationships are seen as non-contributory to Eric's learning problems.

Recommendations

Psychological:

1. His academic achievement is well behind his peers in regular classroom settings and his developmental delays will impede him working at their level. Eric will require much one-on-one instruction to progress academically.

2. Eric processes information best verbally and it is suggested that his curriculum make use of these verbal strengths in the presentation of new material.

3. Due to attentional difficulties, Eric will work best in a classroom setting which provides much structure. He will need frequent breaks and behavior modification techniques may help him sustain concentration on tasks at school.

Education:

1. It is recommended that Eric receive SLD services.

2. He will also need a strong behavior modification program as well as an intensive developmental kindergarten curriculum.

3. Considering his skill development, it is important to provide him with small group instruction with as much individualized attention as possible.

4. To develop his visual-motor skills, utilize activities such as stringing beads, sorting, throwing a bean bag, hammering nails into wood, working with clay, puzzles, coloring, fingerpainting, tracing, cutting, pasting, and template training.

5. Since he needs to develop body image, begin with only one part of the body and teach him to attach labels especially in relation to his own body. Have him outline his body on paper, touch each body part on the paper and verbalize the name for it.

6. Develop short term memory by having him clap a rhythmical sequence and then repeat it. Learn songs, poems, and finger plays that are short and have visual or motor cues in them. Have him repeat digits for numbers or a sequence of objects in order. Provide hem with easy stories for listening so that he can arrange the three major parts of a story. It would also be beneficial to Eric to have him retell the events of a school day before he goes home.

7. He will require a great deal of repetition drill and reinforcement when learning a new skill or concept. It would help to teach him basic concepts such as top, bottom, left, right, and other visual organizational terms. To instill these concepts in Eric it will be necessary to provide him with visual as well as kinesthetic involvement so that he can develop a feel for the meaning of the word.

Medical: Eric should be started on stimulant medication trial for his attention problems.

Speech and Language: No formal language training is recommended. However, teachers working with Eric should be aware of his memory difficulties with lengthy directives. Appropriate social language should also be emphasized in the classroom.

Adrian

Adrian is a 10 year, 1 month old boy. He was diagnosed as having retinoblastoma at age 2 and the left eye was removed, He received chemotherapy for 1 1/2 years plus radiation treatments.

Impressions

Speech and Language: Adrian is functioning at age level in all areas of language comprehension and expression that were assessed. One subtest on the CELF was below criterion. It is felt that this is due to his reticence to volunteer or expand on verbalization.

Psychological: Adrian has average intellectual abilities, although his current performance on verbal-comprehension tasks is clearly limited by his reticence and apparent emotional and motivational factors. His visual motor-integration abilities are also within the average range. The fifteen point decline in his Verbal IQ since 1983 reflects his reluctance to fully participate on verbal expression items. Adrian's affect is consistent with depressive symptomatology. Also by his own report, he is experiencing a loss of appetite and sleeping problems. Both his mother and his teacher rate him as anxious and withdrawn. He is often angry. His current coping is to withdraw and internalize his emotions. Adrian will need much assistance in learning to express his feelings in more appropriate ways.

Medical:

1. Neurologic evaluation is relatively normal with the exception of definite and significant posturing on the right on stressed gait. There is also a suggestion of mild decrease in strength on the left, but this is probably insignificant. Deep tendon reflexes are markedly depressed, or this may be secondary to chronic chemotherapy.

2. Adrian certainly has reasons for a psychological basis to his current behavioral problems and emotional affect. However, another possibility should be considered but can not be documented with current

medical techniques. Adrian had radiation to the left side of the face. Radiation damage to the left frontal part of the brain would be expected to cause problems with spontaneous speech without effecting quality of language. Furthermore, in individuals with frontal lobe damage, attention span difficulties are notable. Finally, Adrian has a definite posturing of the right of his body elicited on stressed gait which would be a manifestation of left posterior-frontal damage effecting the motor cortex or associated areas. Therefore, this evaluation supports an organic basis for some of the behavioral, emotional, and academic difficulties in Adrian. Brain electrical activity mapping on Adrian strongly supports this hypothesis.

Psychiatric: Adrian is struggling with feelings of low self esteem, primarily a function of his difficulty adjusting to his appearance. DSM III diagnosis at this time is 300.40 Dysthymic Disorder. Adrian should continue to be evaluated for the possibility of Major Depression as well.

Recommendations

Educational/Speech and Language:

1. Verbalization should be calmly encouraged, but not demanded, in the classroom. If an appropriate reinforcement can be identified (smiles, points on a point system, etc.) it should be used consistently after appropriate spontaneous verbalizations. Periods of refusal to verbalize should be ignored as much as possible.

2. His teacher should continue to encourage him to speak with her when he has difficulty with his prosthesis. Adrian had just begun to allow her to assist him whenever his eye needs adjustment.

3. Continue with the guidance group services. School personnel should explore more individualized services where he is comfortable to express himself.

4. Continue with reinforcement. Adrian needs development of self esteem. Since his academics are within grade level, it is imperative that these be kept from dropping below his current functioning.

Psychological/Psychiatric:

1. It is important that Adrian receive therapy. He has few alternatives for expressing his anger and needs help in learning new ways to do this. He also needs to deal with feelings about his appearance. Adrian's depression appears significant enough to be interfering with his learning as well as his

peer relationships. Therapy which includes both Adrian and his mother is viewed as critical in making a change in this pattern.

2. Antidepressant medication may be needed depending on the results of individual therapy.

Jon

Jon is a 9 year, 5 month old boy who was diagnosed with rhabdomyosarcoma of the right arm at age 6. He had 2 years of chemotherapy and radiation. He missed many days of school due to his treatment.

Impressions

Psychological: Jon presents as a soft-spoken , left handed boy, who is anxious to perform well and please adults. Cognitive assessment reveals optimal intellectual potential in the Average range, with a significant learning disability involving processing deficits in visual-spatial and visual-motor functioning. His academic functioning is adversely affected in spelling, handwriting, and arithmetic. His extreme difficulty with graphomotor work slows his production and requires such concentration that it distracts him from the substance or meaning of the problem at hand, whether it be spelling, mathematics, or whatever. Associated with this learning disability are apparent emotional factors affecting his learning and performance. Jon gives the impression that he is so anxious to do well, that he finds it difficult to take some of the risks and make some of the errors that are a necessary part of learning. This is seen very strikingly in his arithmetic performance, in which he actually erased what was apparently a correct answer, and his perfect performance on every item that he actually attempted, suggesting that he would not attempt items that he felt he could not succeed at.

Speech and Language: Jon's speech and language skills are more than adequate. However, his hoarseness is not typical of a child with chronic nasal congestion. Vocal examination suggests inadequate use of respiration for phonation.

Medical: Jon is very obese and this is a greater health problem currently than the previously diagnosed cancer. Weight loss at this time is more important and critical to his health, self-concept, and psychological being than chemotherapy or surgery.

Psychiatric: Jon is a cooperative child who relates well. Considering the stress he has been under, he has adapted very well. Jon does not appear to be clinically depressed.

Recommendations:

Education

1. Because of his significant learning disability, strong consideration should be given to SLD services.

2. The school will need to seek alternate ways for Jon to give his answers in class. He could be allowed to type, use manipulatives, verbally give answers, check off the appropriate answer, or some other method in which he could demonstrate his knowledge of the skills learned without the emphasis placed on writing.

3. Jon will need to be taught the sequence of skills of handwriting. It appears that he has had difficulty with letter formation and recalling how the letters are made, as well as motor coordination. It is recommended that he begin on the chalkboard and large unlined paper with adequate practice with straight lines, horizontal lines, circles, and other basic shapes and angles, such as a diagonal, the plus, the triangle, etc. In addition, on the chalkboard, dots could be place for him to follow these various shapes until there is a much more fluid motion. Once he can perform the straight and horizontal line, the teacher should then gradually introduce letters that include these basic strokes such as E,F,i,H,4, etc. Adequate repetition and drill should be provided until the formation of these letters becomes so automatic that Jon is performing a fairly consistent size on unlined paper. Gradually, fold the large paper so that the workplace gets smaller and smaller until it is approximately the size of first grade lined paper and then make the transference to lined paper.

4. Typing is an important skill for Jon to learn now for his future education. Developing handwriting skills in a child this age is going to require patience, consistency, practice, and adaptations in the regular curriculum By giving Jon a skill by which he can perform written responses acceptable in a school setting this may minimize stress for written output.

Psychological:

1. It is important that school personnel keep in mind his poor motor performance and the time he takes with motor tasks, will penalize him with timed tests. Group tests such as the CTBS might need to be adapted if at all

positive for Jon. If he could indicate his response while someone blackens in the answer or at least put an X over it or a check next to it and let someone record it on an answer sheet, this might not cause him as much stress with testing and may even provide information that he knows more than he is able to demonstrate on tests.

2. As much as possible, classroom testing should be motor-free and/or untimed, to allow Jon to demonstrate his mastery of a subject more completely. In his day to day classroom work, Jon will require much more praise and much less negative feedback than most students, including additional recognition for making efforts that are not necessarily successful. Although Jon may benefit from perceptual-motor training, efforts should be made to develop alternative response modes.

Speech and Language: Jon should see an ear, nose and throat specialist to rule out any vocal pathology. If no pathology is found, he should be referred to a speech therapist for further evaluation.

Medical: Encourage Jon to join in activities with peers. He should be able to participate normally in P.E. class or competitive athletics.

As more and more children are living with cancer, attention must be turned to the question of minimizing its effects on their development. The care of the child with cancer should be directed at producing a truly cured child; that is, one who is mentally healthy and who can function at an age-appropriate level in society. For this to be possible, treatment centers and schools must pay attention to the whole child; if we do not...we may find an artificially cured child who is not developed mentally, who has not learned the experiences a normal child needs to learn to be competitive with his peers.

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